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**CATALOGUE OF THE LAND AND FRESH-WATER MOLLUSCA OF TAIWAN
(FORMOSA), WITH DESCRIPTIONS OF NEW SPECIES.**

BY HENRY A. PILSBRY AND Y. HIRASE.

Early in the present year Mr. Okura, collecting for Mr. Hirase, proceeded to Taiwan (Formosa), with instructions to confine his attention chiefly to collecting land shells. He succeeded in getting a large number of species, but many of them only in small quantity, so that the expedition, while laborious and expensive, was hardly productive of so large a supply of specimens as anticipated. The number of species taken (71) was, however, greater than any previous naturalist has obtained, and adds largely to our knowledge of the distribution of known species, besides augmenting the total number of land snails known by the discovery of some 27 new species and 13 subspecies.

The number of species taken is so considerable that it has been thought useful to add the names of all previously known Formosan snails, making the list complete for the island.

Our first knowledge of Formosan land and fresh-water shells was from specimens collected by H. B. M. Vice-Consul Robert Swinhoe, who, though chiefly interested in the higher Vertebrates, accomplished a vast amount of work on invertebrate groups as well. His first sending of land shells to Hugh Cuming, in London, was worked up by Dr. Pfeiffer,¹ the marine and fresh-water forms being identified by H. Adams and Cuming himself, and the list published by Frazer.² Subsequent sendings were described by Henry Adams.³

Few if any additions were made to the list of land snails until the

¹ Descriptions of thirteen new species of land-shells from Formosa, in the collection of the late Hugh Cuming, collected by Mr. Robert Swinhoe, Vice-Consul of that island. By Dr. Louis Pfeiffer. *P. Z. S.*, 1865, pp. 828-831, pl. 46.

No localities are given for the species described in this paper, but we know from a letter from Swinhoe published in *P. Z. S.*, for 1864 that these shells were chiefly from Tamsui in northern Formosa, a few from Takow in the south.

² List of species of mollusks recently collected by Mr. R. Swinhoe in Formosa, etc. *P. Z. S.*, 1865, pp. 196, 197.

List of species of mollusks recently collected by Robert Swinhoe, Esq., H. B. M. Vice-Consul, C. M. Z. S., in Formosa. *Proc. Zool. Soc. Lond.*, 1866, p. 146.

³ Description of fifteen new species of land and fresh-water shells from Formosa, collected by Robert Swinhoe, Esq., Consul at Taiwan in that island. *Proc. Zool. Soc.*, 1866, pp. 316-319, pl. 33.

Descriptions of ten new species of land and fresh-water shells collected by Robert Swinhoe, Esq., in China and Formosa. *P. Z. S.*, 1870, pp. 377-379, pl. 27.

end of the next decade, when Surgeon-General R. Hungerford, Ritter von Fries and a few other naturalists visited the island. Their collections were worked up chiefly by Dr. O. von Möllendorff, who published the results in his enlightening series of papers upon the Chinese snail fauna.⁴ Meantime the *Melaniidæ* collected by Mr. Dickson had been described by Mr. E. A. Smith.⁵ After von Möllendorff's departure for Manila the field was left to Mr. B. Schmacker, then of Hong-kong, whose material was obtained in part from several German friends who travelled in Formosa, but largely by his Japanese collector who spent over three months there in the latter part of 1889. The materials gathered were ably worked up by Schmacker and Boettger.⁶ From 1891 until this time, only a few inconsiderable additions have been made to the list of Formosan mollusks. The data for the principal papers may be tabulated thus:

Authors.	Described as new		No. of species recorded, based on new material.
	Species.	Subspecies.	
Pfeiffer, 1865.....	13		13
H. Adams, 1866, '70.....	18		18
Moellendorff.....	6	2	23
Schmacker and Boettger, 1890-'91	13	7	57
Pilsbry and Hirase.....	29	13	80

The total number of land shells now known from Formosa is 127 species and 17 subspecies; of fresh-water shells 26 species. References to literature have in most cases been restricted to original descriptions and citations pertaining specially to Formosa. In the case of well-known species ranging also outside of the island, references not dealing with Formosa have been omitted.

⁴ Materialien zur Fauna von China. *Jahrbücher der Deutschen Malakozoologischen Gesellschaft*, IX (1882), X (1883), XI (1884), etc.

⁵ Descriptions of five new shells from the island of Formosa and the Persian Gulf, and notes upon a few known species. *P. Z. S.*, 1878, pp. 728-733, pl. 46.

⁶ Neue Materialien zur Charakteristik und geographischen Verbreitung chinesischer und japanischer Binnenmollusken. I, *Nachrichtsblatt der deutschen Malakozoologischen Gesellschaft*, Jahrg. XXII, 1890, pp. 113-137; II, Jahrg. XXIII, 1891, pp. 145-194, pls. 1, 2.

CYCLOPHORIDÆ.

Cyclophorus turgidus Pfr.

Hotawa (Hirase). Has also been reported by E. A. Smith from Formosa, without exact locality, *P. Z. S.*, 1887, p. 318. The specimens taken by Mr. Okura are quite typical. It is a common Ryukyuan species.

Cyclophorus formosaensis Nevill.

J. A. S. Bengal, 1881, p. 148, based upon *C. exaltatus* var. Pfr., Novit. Conch., II, pl. 68, figs. 14, 15.

C. formosensis Nev., Mlldff., Jahrb. d. m. Ges., IX, 1882, p. 277.

Keelung and Takohan (Hungerford). Suganiikei (Hirase). This is probably to be regarded as a variety of *C. turgidus*. The specimens taken by Mr. Okura are not quite elevated enough to be typical.

Mr. E. A. Smith incidentally reports *C. exaltatus* from Formosa (*P. Z. S.*, 1887, 318). It is a well-known Hongkong species, and in view of the excessively critical nature of the species of *Cyclophorus* of the Sino-insular group, the specimens referred by Smith to *exaltatus* may belong to *C. formosaensis*. Some forms given the rank of species in the *exaltatus* group by von Moellendorff and others are distinguished by only slight and elusive characters.

Cyclophorus indicus Desh. is reported from Formosa by H. Adams, *P. Z. S.*, 1866, p. 146.

Cyclophorus moellendorffi Schm. and Bttg.

Nachrbl. d. m. Ges., 1891, p. 191, pl. 2, fig. 9.

South Cape of Formosa, in the mountains (Schmacker). Carinate, with relatively small aperture.

C. m. humicola Schm. and Bttg.

Nachrbl., 1891, p. 193.

South Cape, at the foot of the mountains (Schmacker). There was a transposition of pages 192 and 193 in the *Nachrichtsblatt* which creates some confusion with this form until understood.

Cyclophorus friesianus Mlldff.

Jahrb. d. m. Ges., 1883, p. 286.—S. and B., Nachrbl. d. m. Ges., 1891, p. 191.

Lakuli (Fries); Bankimtsong and Bagsa. Distinguished by having numerous small carinæ above and below the peripheral keel.

Japonia zebra n. sp.

Shell umbilicate, conic-turbinate, pale yellowish-corneous with numerous red-brown longitudinal stripes, waved below the periphery, and about as wide as the light intervals. Surface glossy, with sculpture of numerous spiral threads separated by rather wide intervals, and most of

them bearing rather long, delicate hairs. There are about ten of these hair-bearing threads on the last whorl. Spire straightly conic. Whorls $4\frac{1}{2}$, very convex. Aperture slightly oblique, subcircular, the peristome simple, the ends connected by a short, very thin parietal callus.

Alt. 5, diam. 5 mm.; diam. aperture 2.3 mm.

Taihoku, Taiwan. Type No. 90,240 A. N. S. Phila., from No. 1,389 of Mr. Hirase's collection.

The handsome coloration and numerous spiral series of hairs are the more conspicuous features of this pretty *Japonia*, of which but two specimens were taken.

***Japonia formosana* n. sp.**

Shell umbilicate, turbinate-conic, with rather slender spire, the outlines concave. Dark red-brown or rather light olive colored. Surface but slightly shining, striatulate, with a number of low, irregularly spaced spiral cords or threads, often in part indistinct, and when fresh with irregularly spaced cuticular lamellæ along the lines of growth. There are two or three series of sparse hairs, readily deciduous, on the last whorl. Whorls 5, very convex. Aperture circular, subvertical, the peristome simple, ends connected by a very short parietal callus.

Alt. 5, diam. 5 mm.

Hotawa, Taiwan. Types No. 90,238 A. N. S. Phila., from No. 1,407 of Mr. Hirase's collection.

Only five specimens were taken. The cuticular lamellæ and hairs are sometimes entirely lost, perhaps always in old shells. Of the two specimens in the type lot, they are developed on the dark red-brown specimens which may be regarded as typical, and absent from the pale greenish one.

***Leptopoma vitreum taivanum* Mldff.**

Leptopoma taivanum Mldff., Jahrb. d. m. Ges., X, p. 287, pl. 10, fig 4.—S. and B., Nachrbl., 1890, p. 125.

L. vitreum var. *lactea* Kob., S. and B., Nachrbl. d. m. Ges., 1891, 190.

Lakuli, near Takao (Fries); South Cape (Lauts); Bankimtsong and Bagsa (Schmacker). Also taken in Formosa by Prof. Steere.

***Cyclotus taivanus* H. Ad.**

P. Z. S., 1870, p. 378, pl. 27, fig. 11.—Mldff., Jahrb. d. m. Ges., X, 1883, p. 283.—Schm. and Bttg., Nachrbl., 1891, 192.

Taiwan (Swinhoe); Lakuli, near Takao (von Fries); Inrin, Tapanii and Ensui-kō (Hirase); Bankimtsong (Schmacker).

***Cyclotus taivanus adamsi* n. subsp.**

Shell similar to *C. taivanus*, but uniform yellow or tawny-yellow, more elevated, with the umbilicus narrower. Taihoku.

Alt. 10, diam. 14, aperture 6.9 x 6.5 mm., umbilicus 3.1 mm. wide.

Alt. 9.9, diam. 14.2, aperture 6.9 x 6.5 mm., umbilicus 3.2 mm. wide.

Cyclotus swinhoei H. Ad.

P. Z. S., 1866, p. 318, pl. 33, fig. 9.

Takao (Swinhoe). Sculptured with raised spiral threads.

Alt. 7, diam. 11 mm.

Cyclotus swinhoei depressus n. subsp.

Shell similar to *C. swinhoei* but more depressed.

Alt. 6, diam. 11 mm., umbilicus 2.9 mm. wide; diam. and alt. aperture with peristome 4.9 mm.

Giiran. Type No. 89,915 A. N. S. Phila., from No. 1,372 of Mr. Hirase's collection.

Cyclotus minutus H. Ad.

P. Z. S., 1866, p. 318, pl. 33, fig. 9.—Schm. and Bttg., Nachrbl., 1891, p. 192 ??

Takao (Swinhoe); Takao and Bagsa (Schmacker).

The typical form was not found by Mr. Okura. Prof. Steere collected a large series some years ago, part of which are in our collections.

Cyclotus minutus concentratus n. subsp.

Shell reddish-brown or pale olive-green with a brown spire, closely sculptured with fine spiral threads (closer than in *C. minutus*) on a glossy ground, except for a band below the suture (both on the spire and within the umbilicus), which is covered with narrow whitish cuticular rays. Whorls $3\frac{3}{4}$, tubular, the last barely in contact at the mouth. Umbilicus much smaller than the aperture, and smaller than in *C. minutus*. Aperture but slightly oblique, circular, the peristome a little expanded, obtuse. Operculum concave, with dark gray central spot and obliquely striate whorls.

Alt. 5.3, diam. 7.9 mm.; width of umbilicus 2 mm.

Chikutozaki, Taiwan. Types No. 89,897 A. N. S. Phila., from No. 1,426 of Mr. Hirase's collection. Six specimens taken.

Cyathopoma taiwanicum n. sp.

Shell umbilicate, conic, corneous, somewhat translucent. Whorls $3\frac{1}{2}$, the first smooth, dark corneous, the rest spirally lirate, very convex, the penultimate with four or five thread-like spirals. Last whorl tubular, the threads weaker on its later part, much stronger around and in the umbilicus. Aperture circular, the peristome thin, simple, barely in contact with the preceding whorl. Operculum lodged at the aperture, white, concave externally, usually with a dark dot at the center.

Alt. 1.5, diam. 2 mm.

Giiran, Taiwan. Types No. 89,945 A. N. S. Phila., from No. 1,365a of Mr. Hirase's collection.

The genus *Cyathopoma* is not yet known from China. Its eastern limit has hitherto been the Khasi, Naga and South Garo Hills, where the species are like the Formosan in features of the operculum. It has not been found north of these places, nor eastward in the Daffa Hills, so that its known range heretofore has been sub-Himalayan and southward.

In this and other known Formosan and Japanese *Cyathopomas*, the shell has no fibrous vertically striated coating, such as is conspicuous in the Indian *C. filocinctum* and others. The whorls of the operculum have no projecting lamellæ. The species belong therefore to the subgenus *Jerdonia*, as defined by Kobelt (*Das Thierreich*, Cyclophoriden, p. 219). It is clear, however, that Kobelt ignores the character of the operculum in his distribution of the species of *Cyathopoma* and *Jerdonia*.

C. taiwanicum is not unlike *C. album* Bedd., but it has more spirals, and they are not so prominent in the umbilicus.

There is a form of *C. taiwanicum* from Chosokei which is a little more variable in sculpture than the type lot, sometimes having one or two more spiral threads.

***Cyathopoma taiwanicum degeneratum* n. subsp.**

At Suganiikei, Taiwan, five specimens were taken which differ from *C. taiwanicum* by the degeneration of the spiral threads, which are very weak or even almost wanting on the last whorl. Types are No. 89,944 A. N. S. Phila., from No. 1,365b of Mr. Hirase's collection.

***Cyathopoma micron* (Pils.).**

Cyclotus micron Pils., Nautilus, 1900, p. 12.

Taihoku (Hirase). Also found in the Ryukyu Islands and Japan.

Mr. Ancey has proposed a genus *Nakadiella* for *Cyclotus* (?) *micron*; but this species differs from typical forms of *Jerdonia* in nothing but the absence of spiral striation. There are a number of equally smooth species in Ceylon. *Nakadiella* may be retained as a sectional name for the smooth forms, if the distinction proves to be natural; otherwise it will become a synonym of *Jerdonia*.

***Ptychopoma* (?) *wilsoni* (Pfr.).**

Pterocyclos wilsoni Pfr., P. Z. S., 1865, p. 831, pl. 46, fig. 12.

Ptychopoma w., Kobelt, *Das Thierreich*, Cyclophoriden, p. 85.

Formosa (Swinhoe). The operculum is still unknown, and the generic position therefore uncertain.

Pupinella swinhoei H. Ad.

P. Z. S., 1866, p. 318, pl. 32, fig. 12.—Schm. and Bttg., Nachrbl., 1891, p. 187, with var. *meridionalis*.

Pupina adamsi Sowb., Conch. Icon. XX, pl. 4, fig. 33.

Pupinopsis morrisonia H. Ad., P. Z. S., 1872, p. 13, pl. 3, fig. 21.

Tamsui (Swinhoe); Anshiryosan, Hotawa and Suganiikei (Hirase).

This species varies a good deal in size and structure of the lip, but Schmacker and Boettger seem to be right in holding that all the described Formosan forms are but varying races of one species. The specimens from Hotawa are about typical, length 13 mm. Those from Anshiryosan seem referable to the race *morrisonia* H. Ad., described from Mt. Morrison. They are 10.5–11 mm. long, and have the upper funnel of the lip much smaller than in the type. At Suganiikei there is also a small form of about the same length.

The var. *meridionalis* S. and B. is distinguished by smaller size, length 9.5 to 11, width $4\frac{1}{4}$ to $4\frac{3}{4}$ mm. It is from Bankimsong. The type of *P. morrisonia* is 12 x 5 mm., while the size of typical *P. swinhoei* is given as 14 x 5.5 mm.

Diplommata hungerfordiana Nevill.

Jour. Asiat. Soc. Bengal, L, 1881, p. 150.—Mlldff., Jahrb., IX, 349.

Keelung (Hungerford)=Kiirun (Hirase). Dr. von Moellendorff considered this a variety of the Chinese *D. paxillus* Gredler; but its differential features seem constant.

Diplommata taiwanica n. sp.

Shell imperforate, the lower half cylindric, upper half conic, light orange colored, darker toward the apex. Whorls $6\frac{1}{2}$, the first $4\frac{1}{2}$ regularly increasing, the next whorl larger, swollen, the last whorl much smaller, especially as seen in a dorsal view. First $1\frac{1}{2}$ whorls smooth, the next $3\frac{1}{2}$ sculptured with delicate thread-like riblets which become a little closer on the front of the swollen penultimate whorl, and then become more or less obsolete, so that the last whorl or whorl and a half are nearly or quite smooth. Constriction median above the aperture. Palatal plica short, partly under the parietal callus. Aperture vertical, irregularly rounded, the columellar margin straightened. Peristome well expanded and somewhat thickened, angular at the junction of the columellar and basal margins; parietal callus rather small, its border usually indistinct. Columellar tooth small.

Length 2.9, diam. 1.5 mm.

Giiran, Taiwan. Types No. 89,965 A. N. S. Phila., from No. 1,364b of Mr. Hirase's collection.

In *D. hungerfordiana* the cone of the spire is shorter. Another set

of specimens from Giiran differs in having the last two whorls striate throughout, the striae closer than on the conical upper portion of the spire. This may be only individual variation. Eleven of the entirely striate and fifteen of the typical specimens were taken.

***Diplommatina taiwanica suganiikeiensis* n. subsp.**

Shell brownish corneous, more obese than *D. taiwanica*; last whorl more ascending to the aperture, and more deeply constricted; striation finer and nearly even throughout, very weak; palatal plica very short; basal angle more projecting.

Length 3, diam. 1.7 mm., whorls $5\frac{1}{2}$.

Suganiikei, Taiwan. Types No. 89,966 A. N. S. Phila., from No. 1,364c of Mr. Hirase's collection.

This form seems rather unlike *D. taiwanica*, and unless intermediate specimens are found it will probably rank as a distinct species. Only nine individuals were taken.

***Diplommatina camura* n. sp.**

Shell imperforate, cylindric below, conic above, pale orange or brownish-yellow. Whorls 6, the first 4 regularly increasing, the next whorl swollen, the last much smaller, especially as seen dorsally. First $1\frac{1}{2}$ whorls smooth; following whorls of the cone sculptured with widely spaced thread-like riblets, penultimate whorl with the riblets much closer, last whorl smooth. Constriction rather deep, median above the mouth. Palatal plica very weak and short. Aperture vertical, irregularly rounded. Parietal callus moderate, with distinct edge. Peristome well expanded, thickened within, wide, projecting at the junction of the columellar and basal margins. Columellar lamella moderately prominent, very short inside.

Length 3, diam. 1.6 mm.

Hotawa, Taiwan. Types No. 90,243 A. N. S. Phila., from No. 1,424 of Mr. Hirase's collection.

This species differs from *D. taiwanica*, chiefly by its very small palatal plica and the very short columellar lamella, which in *taiwanica* ascends to the constriction. *D. tokunoshimana* differs from *camura* in sculpture and the well-developed palatal plica.

***Diplommatina prava* n. sp.**

Shell cylindric below, conic above, imperforate, pale yellowish corneous, the upper whorls often orange tinted. Whorls $6\frac{1}{2}$, regularly increasing to the penultimate, which is wider but not especially swollen; last whorl scarcely smaller, its last third making a long ascent to the aperture. Sculpture of weak rather close and very fine thread-

like striae. Constriction distinct, situated near or at the end of the penultimate whorl, behind the lip. Aperture irregularly rounded, the columellar side straight. Parietal callus small. Peristome expanded and thickened or duplicated, the outer lip, in profile, seen to be a little retracted or concave in the middle, projecting in a blunt point a short distance from the upper insertion; an angle outside at the junction of the columellar and basal margins.

Length 2.3, diam. 1.2 mm.

Giiran, Taiwan. Types No. 89,967 A. N. S. Phila., from No. 1,369 of Mr. Hirase's collection.

Smaller than any other known Formosan *Diplommatina*, and readily distinguished by the retrograde constriction, sinuous outer lip, etc. It resembles *D. luchuana* somewhat, but differs in the position of the constriction, stronger basal angle, less distinct parietal callus, etc. It occurred in some numbers (*pravus*, deformed).

Slightly smaller specimens were taken at Suganiikei. At Hotawa the sculpture is better developed.

***Palaina formosana* n. sp.**

Shell sinistral, minute, pupiform, imperforate, yellow or pale brownish-yellow, sculptured with delicate, distant, thread-like very oblique riblets, about 7 in number on the last whorl, absent on the front of this whorl, and very weak on the penultimate whorl. Whorls 5, convex, the first three regularly and rapidly increasing, the penultimate very much swollen, predominating, the last whorl smaller, rapidly tapering to the base, slightly constricted immediately above the aperture. Suture well impressed, quite oblique. Aperture rounded, the peristome yellow, narrowly expanded, doubled in old shells; the margins continued in a callus with raised edge, spreading up above the aperture nearly to the preceding suture. Columellar tooth small, deeply placed.

Length 2, diam. 1.1 mm.

Hotawa, Taiwan. Types No. 89,969 A. N. S. Phila., from No. 1,413 of Mr. Hirase's collection.

This species belongs to the subgenus *Cylindropalaina*. It is the first of its kind known from Formosa. The Indian *Palaina gibberosa* Godwin-Austen (*Land and Fresh-water Mollusca of India*, II, p. 16, pl. 66, figs. 12a-c) is closely related, but differs in being much wider and more obese.

***Pseudopomatias eos* n. sp.**

Shell perforate, turreted, regularly tapering to the obtuse apex, rather thin but strong, opaque greenish-corneous, with more or less brown on

the last whorl and sometimes on the spire; glossy, sculptured throughout with strong, nearly straight ribs, except the first whorl, which appears to be smooth. Whorls 7, quite convex, the last rounded peripherally and below. Aperture circular, vertical, the peristome reflexed, thickened on the face, narrow where in contact with the preceding whorl. There is a small notch or groove at the junction of the outer and parietal margins of the peristome.

Length 8, diam. 3.1; length of aperture 2.1, width 2.1 mm., including peristome. Length 7.1, diam. 3 mm.

Hotawa, Taiwan. Types No. 89,917 A. N. S. Phila., from No. 1,416 of Mr. Hirase's collection.

This species stands close to *P. amœnus* Mlldff. of China. It is a little more slender than the Chinese species, the last whorl is quite regular in shape, and the umbilical slit is shorter. The genus is new to Formosa.

***Alycæus (Dioryx) swinhoei* H. Ad.**

P. Z. S., 1866, p. 318, pl. 33, fig. 11.—Schm. and Bttg., Nachrbl., 1891, p. 189.

Takao (Swinhoe); Bagsa (Schmacker); Suganiikei and Sammaipo (Hirase).

***Alycæus hungerfordianus* G. Nevill.**

Jour. Asiat. Soc. Beng., L, 1881, p. 149.—Mlldff., Jahrb., IX, p. 344, pl. 10, fig. 6.

Northern Formosa (Hungerford).

[*Alycæus mouhoti* Pfr. has been erroneously credited to Formosa by Sowerby, *Conch. Icon.*, XX, pl. 3, fig. 19.]

***Alycæus varius* n. sp.**

Shell openly umbilicate, depressed, the spire very low, convex, apex projecting mucro-like; surface lusterless, ashen or dull reddish, rather obsoletely striate, the striæ stronger and crowded on the swollen part of the last whorl, thinner, more delicate and subobsolete on the neck. Whorls $3\frac{3}{4}$, the first corneous or reddish, the last swollen laterally, then strongly contracted, slightly enlarged and deeply deflexed beyond the contraction. Tube long. Aperture circular, oblique; peristome well expanded, thickened within, the columellar margin wider.

Alt. 2.5, diam. 4 mm.

Taihoku, Taiwan. Types No. 90,244 A. N. S. Phila., from No. 1,383 of Mr. Hirase's collection.

This species is related to *A. laeovicervix*, but that has a smoother neck and a shorter sutural tube. The aperture is peculiarly turned inward.

***Helicina hungerfordiana formosana* Schm. and Bttg.**

Nachrbl. d. m. Ges., 1891, p. 186.

Bankimsong and Bagsa (Schmacker); Suganiikei (Okura).

We quite agree with Schmacker and Boettger as to the very close relationship of this to *H. hungerfordiana* of China. The Suganiikei specimens are a trifle less angular peripherally than Schmacker and Boettger's figure.

***Helicina badia* Schm. and Bttg.**

Nachrbl., 1891, p. 185, pl. 2, fig. 8.

Takao and South Cape (Schmacker).

***Helicina verecunda* Gld.**

Otia Conch., p. 105.

Sammaipo (Hirase). The specimens are typical. Also Ryukyu Islands.

***Truncatella valida* Pfr.**

Schmacker and Boettger, Nachrbl., 1891, p. 194.

South Cape (Schmacker). Also in the Philippines, Malacca Peninsula and southward, and in the Ryukyu Islands.

HELICIDÆ.

[*Helix luhuana* Sowerby has been reported from Formosa, specimens identified by Cuming (*P. Z. S.*, 1865, p. 197, No. 84). We doubt its occurrence there. *Helix melanostoma* has been recorded from Formosa in a list of Swinhoe's shells, identified by Cuming. Mr. Gude has already remarked upon this anomalous record.]

***Eulota (Aegista) subchinensis* ('G. Nev.' Mldff.).**

Jahrb. d. m. Ges., XI, 1884, p. 355, pl. 7, fig. 8.

Tamsui (Hungerford); Taihoku (Hirase).

***Eulota (Plectotropis) mackensii* (A. and R.).**

Zool. Samarang, Moll., p. 60, pl. 15, fig. 6.

Taihoku. Specimens practically typical though rather small, 27 to 30 mm. diam., and either rich chestnut or greenish-yellow in color. Also Ryukyu Islands.

***Eulota (Plectotropis) mackensii formosa* Pils.**

Nautilus, XVI, 1902, p. 46.

Taihoku (Hirase); Tamsui (Schmacker).

***Eulota (Plectotropis) impeza* n. sp.**

Shell very openly umbilicate, the umbilicus regularly conic; low conoid above, convex beneath; rather thin, pale clear brown. Sculp-

ture of low oblique wrinkles along the lines of growth, and minute, very short cuticular adnate threads in places; the base densely but not very distinctly striate spirally. Peripheral filaments sparse and short. Whorls $6\frac{1}{2}$, slowly widening, the early ones convex, the later nearly flat; last whorl acutely carinate, the base angular around the umbilicus. Aperture very oblique, the lip narrowly expanded, basal margin narrowly reflexed, deeply arcuate; columellar margin dilated; parietal callus very thin.

Alt. 10, diam. 26.7 mm.

Anshiryozan, Taiwan. Types No. 89,984 A. N. S. Phila., from No. 1,433 of Mr. Hirase's collection.

A delicate and handsome *Plectotropis* of the *mackensii* group, with narrower spire and wider last whorl than *mackensii*, wide-spaced peripheral filaments, finer sculpture, and openly conic umbilicus.

***Eulota fulvicans* (H. Ad.).**

P. Z. S., 1866, p. 316, pl. 33, fig. 2.

Tamsui (Swinhoe).

***Eulota* (*Plectotropis*) *fulvicans browni* n. subsp.**

Shell low trochoidal, umbilicate, the umbilicus one-fifth the diameter of the shell; thin, pale brownish corneous. Surface dull, lusterless, densely beset with *very short, delicate, erect bristles*, in large part removed by wear from the upper surface. Spire conic, its lateral outlines a trifle convex. Whorls $6\frac{3}{4}$, slowly widening, the last very little descending in front, acutely carinate throughout, the base convex. Aperture very oblique, slightly angular outwardly. Peristome thin, expanded, the basal margin reflexed, columellar margin dilated, running forward.

Alt. 7.9, diam. 12.5 to 12.7 mm.

Formosa (Taiwan). Type No. 4,639 A. N. S. Phila., part of the A. D. Brown collection.

This form differs from *E. perplexa* in sculpture. It is not so high as *E. fulvicans* H. Ad., and the shape of the aperture differs. *E. fulvicans* is known to us by the description and figure only. *E. lautsi brachylasia* S. and B. is also related.

***Eulota* (*Plectotropis*) *lautsi* (Schm. and Bttg.).**

Nachrbl. d. m. Ges., 1890, p. 4, pl. 1, fig. 1.

H. shermani var. *lautsi* S. and B., Nachrbl., 1891, p. 154.

South Cape (Lauts); Bankimtsong, Takao (Schmacker).

***Eulota lautsi brachylasia* (Schm. and Bttg.).**

Nachrbl. d. m. Ges., 1891, p. 156.

Takao.

Eulota lautsi micra n. subsp.

General shape of *E. lautsi*. Pale brownish-corneous, unicolorous or with a red-brown band on the acute peripheral keel. Smooth, showing faint striation under a lens, with nearly effaced scarcely visible spiral striæ on the dull upper surface, densely striate spirally on the base. Whorls fully six. Outer and basal margins of the peristome expanded, subreflexed; columellar margin very steeply ascending, dilated above.

Alt. 5.7, diam. 9.8 mm.; width of aperture 4.8, of umbilicus 1.8 mm.

Tapanii, Taiwan. Types No. 89,875 A. N. S. Phila., from No. 1,428 of Mr. Hirase's collection.

Compared with typical *lautsi*, this form differs in the small size, wider mouth as seen in front view, and narrower last whorl as seen from above, and it wants a white edge on the keel. A small form of *lautsi* has been recorded by Schmacker and Boettger from Takao.

The subordination of *lautsi* to *H. shermani* Pfr. in Schmacker and Boettger's second discussion of it was apparently an error, *H. shermani* being a *Trochomorpha*.

Eulota (Plectotropis) inrinensis n. sp.

The shell is depressed-trochiform, thin, umbilicate, the umbilicus narrow, less than one-fifth the diameter of the shell, rapidly contracting within; pale brownish-corneous, lusterless, lightly striatulate, and finely striate spirally, the spirals very delicate, scarcely visible above, more distinct below. Spire low-conic, with nearly straight outlines. Whorls $5\frac{1}{4}$ to $5\frac{1}{2}$, somewhat convex, the last acutely carinate at the periphery, convex below, slightly descending in front. Aperture quite oblique. Peristome thin, narrowly expanded, the basal margin deeply arcuate, reflexed, columellar margin dilated above.

Alt. 5, diam. 8.9 mm.; width of aperture 4 mm.

Alt. 5, diam. 8 mm.; width of aperture 3.8 mm.

Inrin, Taiwan. Types No. 89,872 A. N. S. Phila., from No. 1,393 of Mr. Hirase's collection.

Only four specimens of this little *Plectotropis* were taken. It is closely related to *E. lautsi micra*, yet differs by the more diminutive size, narrower umbilicus, less dilated columellar lip and paler color. It is decidedly more depressed than *E. hebes*.

Eulota (Plectotropis) hebes n. sp.

Shell trochiform, very thin, umbilicate, pale brown, but slightly shining, weakly striatulate, and showing very fine, weak spiral striæ beneath. Spire conic, the apex obtuse. Whorls $5\frac{1}{2}$, convex, the last strongly carinate at the periphery, the keel projecting but blunt at the

edge, becoming weak near the aperture; slightly descending in front. Suture well impressed. Aperture oblique, broadly lunate, the peristome thin, narrowly expanded, the columellar margin dilated above; basal margin deeply arcuate.

Alt. 5.4, diam. 7 mm.; width of aperture 3.3 mm.

Suganiikei, Taiwan. Type No. 90,047 A. N. S. Phila., from No. 1,390 of Mr. Hirase's collection.

Very rare, as only two fully adult shells were found. With as many whorls as *E. inrinensis*, this species is smaller, more elevated, with a narrower umbilicus and a more deeply arcuate basal lip. It has much the shape of the far larger *E. fulvicans* (H. Ad.).

***Eulota (Plectotropis) perplexa* n. sp.**

Shell trochoidal, thin, rather openly umbilicate, the umbilicus about one-fourth the diameter of the shell, rapidly contracting inward. Surface dull, covered with a brown cuticle, sculptured with minute closely placed, short, linear, raised processes above the periphery, with an under-sculpture of indistinct fine spiral lines; below the periphery it is very closely engraved with fine spiral lines. The spire is conic, with straight lateral outlines. Whorls $6\frac{1}{4}$, slowly increasing, but slightly convex, the last with a slightly projecting, acute keel at the periphery, descending slightly below the keel to the aperture. Suture well impressed, following the lower edge of the keel. Aperture oblique, peristome thin, the basal and outer margins narrowly reflexed, arcuate, the upper margin but slightly arcuate, hardly expanded, columellar margin nearly vertical, arcuate, dilated above; parietal callus very thin.

Alt. 8.2, diam. 12 mm.; diam. of aperture 5.3 mm.; of umbilicus nearly 3 mm.

Suganiikei, Taiwan. Types No. 89,874 A. N. S. Phila., from No. 1,377 of Mr. Hirase's collection.

This snail is related to *E. granti* Pfr., *E. fulvicans* H. Ad. and especially to *E. lautsi brachylasia* S. and B., a decidedly less elevated form.

***Eulota (Plectotropis) granti* (Pfr.).**

P. Z. S., 1865, p. 828, pl. 46, fig. 10.

Formosa (Swinhoe).

***Eulota (Acusta) assimilis* (H. Ad.).**

P. Z. S., 1866, p. 316, pl. 33, fig. 1.—S. and B., Nachrbl., 1891, p. 158.—Mldff., Jahrb., XI, p. 370.

Takao (Swinhoe, Steere).

[*Eulota (Acusta) redfieldi* (Pfr.) has been reported from Formosa by Fraser, the specimens collected by Swinhoe and identified by Cumming. Later confirmation is lacking.]

***Eulota (Acusta) sieboldiana* (Pfr.).**

Jyushikyaku (Hirase). I cannot distinguish these from Japanese examples. The species is not, we believe, found in the Ryukyu Islands. It has been identified from Formosa by H. Cumming (*P. Z. S.*, 1865, p. 197), from specimens sent by Swinhoe. It occurs also in Corea, but has not been found in China.

***Eulota (Eulotella) similis* (Fér.).**

Mildff., *Jahrb.*, XI, 1884, p. 325.

A Formosan specimen before me, received from Cumming, and probably collected by Swinhoe, belongs to the angular race *stimpsoni* Pfr.

***Eulota (Acusta) tourannensis* (Soul.).**

Rev. Zool., 1842, p. 101.—*Voy. Bonite*, p. 507, pl. 29, figs. 1, 2.—*Schm. and Bttg., Nachrbl. d. m. Ges.*, 1891, p. 158.

South Cape (Schmacker).

***Eulota (Euhadra) swinhoei* (Pfr.).**

P. Z. S., 1865, p. 829, pl. 46, fig. 6.

Formosa (Swinhoe); Taihoku (Hirase). The shells taken at this place are small (diam. 45 mm.) and light yellowish-olive with some darker streaks, quite unlike the typical form in color. Mr. Okura took only three specimens.

***Eulota (Euhadra) pancala* (Schm. and Bttg.).**

Helix bacca var. *sinistrorsa* Mildff., *Jahrb.* XI, p. 387.

Helix (Hadra) pancala S. and B., *Nachrbl.*, 1891, p. 161, pl. 1, fig. 6.

South Cape, in the mountains (Schmacker).

***Eulota (Euhadra) pancala trifasciata* (Schm. and Bttg.).**

L. c., p. 162.

South Cape, at foot of the mountains (Schmacker).

***Eulota (Euhadra?) formosensis* (Pfr.).**

P. Z. S., 1865, p. 829, pl. 46, fig. 7.

Formosa (Swinhoe). A sinistral species, not found by any later collector.

***Eulota (Euhadra) bacca* (Pfr.).**

P. Z. S., 1865, p. 829, pl. 46, fig. 8.

Formosa (Swinhoe).

***Eulota (Euhadra) succincta* (H. Ad.).**

P. Z. S., 1866, p. 316, pl. 33, figs. 4, 4a.—S. and B., *Nachrbl.*, 1891, 159.

Takao (Swinhoe); Ape Hill, Takao and Bagsa (Schmacker).

Eulota (Euhadra) succineta amblytropis Pils.

Proc. A. N. S. Phila., 1901, p. 193.

Formosa (Steere); Taiwan (Hirase).

Eulota (Euhadra) friesiana (Mlldff.).

Jahrb., XI, 1884, p. 385, pl. 9, figs. 3, 4.—S. and B., Nachrbl., 1891, pp. 159, 160.—Man. Conch., VI, p. 118.

Takao (Fries); Bankimtsong (Schmacker); Tapanii (Hirase).

Eulota (Euhadra ?) mellea (Pfr.).

P. Z. S., 1865, p. 829, pl. 46, fig. 4.

Formosa (Swinhoe); Suganiikei (Hirase).

A peculiar snail, of doubtful systematic position.

Eulota (Coniglobus) bairdi (H. Ad.).

P. Z. S., 1866, p. 316, pl. 33, fig. 3.

Tamsui (Swinhoe).

Eulota (Coniglobus) nux (Mlldff.).

Nachrbl. d. m. Ges., 1888, p. 43.

E. sargentiana Pils., Proc. A. N. S. Phila., 1901, p. 194.

Formosa (Mlldff.); Hotawa (Hirase). The specimens collected by Mr. Okura are a little lower than Moellendorff's type. *E. sargentiana* is a still more depressed form, perhaps varietally separable. The original specimens were anonymously sent to von Moellendorff, without exact locality.

Eulota (Coniglobus) sphæroconus (Pfr.).*Bulimus sphæroconus* Pfr., P. Z. S., 1865, p. 830, pl. 46, fig. 3.*Helix sphæroconus* Pfr., Pils., Man. Conch., VIII, p. 200, with var. *campochilus*, p. 201, pl. 53, fig. 76.

Formosa (Swinhoe); Suganiikei (Okura), the typical small form and var. *campochilus* Pils. This species is type of *Coniglobus* n. subg.

Buliminopsis incerta (Pfr.).*Bulimus incertus* Pfr., P. Z. S., 1865, p. 830, pl. 46, fig. 1.*Pseudobuliminus incertus* Pfr., S. and B., Nachrbl., 1891, p. 164.*Helix (Satsuma) taivanica* Mlldff., Jahrb., 1886, p. 197.

Formosa (Swinhoe); Taihoku (Hirase); South Cape (Schmacker).

Dolicheulota swinhoei (Pfr.).*Bulimus swinhoei* Pfr., P. Z. S., 1865, p. 830, pl. 46, figs. 2, 2a.

Formosa (Swinhoe).

Dolicheulota formosensis (H. Ad.).*Bulimus (Amphidromus) formosensis* H. Ad., P. Z. S., 1866, p. 317, pl. 33, fig. 5.—Schm. and Bttg., Nachrbl., 1891, p. 195.*Dolicheulota formosensis* Pils., Man. Conch., XIV, p. 19, pl. 2, figs. 26–28.

Tamsui Mountains (Swinhoe); Bankimtsong (Schmacker); Lakuli Mountains (Fries); Anshiryosan (Hirase).

Allowing *Buliminopsis* and *Dolicheulota* to stand as genera is a concession to the genus splitters. The former is known to be an *Eulota* anatomically, and the latter will probably prove to have the anatomy of *Euhadra*.

Ganesella albida (H. Ad.).

P. Z. S., 1870, p. 378, pl. 27, fig. 9.—Schm. and Bttg., Nachrbl., 1891, p. 159.—Mildf., Jahrb., XI, p. 335.

Taiwan-fu (Swinhoe); Takao; Bankimtsong (Schmacker); Sammaipo (Hirase).

Ganesella albida insignis n. subsp.

Shell similar to *G. albida*, but having a purple-black area around the axis, the columella and basal lip of the same color; the apical whorl also sometimes black. Whorls 6.

Alt. 16.8, diam. 14.3 mm.

Alt. 15.8, diam. 12.5 mm.

Hotawa, Taiwan. Types No. 89,989 A. N. S. Phila., from No. 1,403 of Mr. Hirase's collection.

Five specimens of this charming snail were taken.

Chloritis hungerfordianus ('G. Nevill').

Jahrb., XI, 1884, p. 336, pl. 7, fig. 7.

Formosa (Hungerford); Suganiikei (Hirase), two examples. Von Moellendorff also reports the species from the island of Hongkong.

Moellendorffia (Trihelix) hiraseana Pilsbry.

Nautilus, XIX, Oct., 1905, p. 66, pl. 2, figs. 4, 5, 6.

Hotawa (Hirase).

STREPTAXIDÆ.

Streptaxis (Odontartemon) heudei Schm. and Bttg.

Nachrbl., 1891, p. 147, pl. 1, fig. 1.

South Cape (Schmacker); Sammaipo (Hirase).

Ennea (Huttonella) bicolor (Hutt.).

Schm. and Bttg., Nachrbl., 1891, p. 148.

Takao (Schmacker); Taiwan (Hirase).

Ennea (Elma) swinhoei H. Ad.

P. Z. S., 1866, p. 317, pl. 33, fig. 8.—S. and B., Nachrbl., 1891, 148.

Tamsui (Swinhoe); Bankimtsong (Schmacker); Taihoku (Hirase).

Ennea swinhoei hotawana n. subsp.

Shell decidedly smaller than *E. swinhoei*, composed of fewer whorls. Length 10, diam. 4.4 mm., whorls $7\frac{1}{2}$.

Length 9.3, diam. 3.7 mm., whorls $7\frac{1}{2}$.

Hotawa. Types No. 89,940 A. N. S. Phila., from No. 1,408 of Mr. Hirase's collection.

ACHATINIDÆ.

Opeas gracile (Hutt.).

Schm. and Bttg., Nachrbl., 1891, p. 178.

South Cape and Takao (Schmacker).

Opeas clavulinum (P. and M.) ?

Schm. and Bttg., 1901, p. 179.

Takao (Schmacker).

Opeas pyrgula 'A. Ad.,' S. and B.

Schm. and Bttg., Nachrbl., 1891, p. 179.

South Cape (Schmacker). Also Japan and China.

ACHATINELLIDÆ.

Tornatellina boeningi Schm. and Bttg.

Nachrbl., 1891, p. 180, pl. 2, fig. 7.

Tamsui, in northern Formosa (G. Degener-Boening). *T. inexpectata* of the Ryukyu Islands is very similar to this, probably not specifically distinct.

PUPILLIDÆ.

Ena cantori taiwanica (Mlldff.).

Buliminus c. t., Mlldff., Jahrb., 1884, 165.—Schm. and Bttg., Nachrbl., 1891, 166.

Takao, Banksa and Bankimtsong (Schmacker).

Ena luchuana (Pils.).

Buliminus luchuana Pils., Nautilus, XIV, March, 1901, p. 129.

Hotawa (Hirase). Originally described from the Loochoo Islands. A smaller variety was taken at Giiran.

Ena leptostraca (Schm. and Bttg.).

Buliminus l., S. and B., Nachrbl., 1891, p. 166, pl. 1, fig. 7.

South Cape (Schmacker).

Ena warburgi (Schm. and Bttg.).

L. c., p. 167, pl. 2, fig. 1.

South Formosa (Dr. Otto Warburg).

CLAUSILIDÆ.

Clausilia (Euphædusa) *eumegetha* Schm. and Bttg.

Nachrbl., 1891, p. 168, pl. 2, fig. 2.

Takao (Schmacker).

Clausilia (Euphædusa) aculus Bens.

Taihoku (Hirase). A well-known Chinese species.

Clausilia (Hemiphædusa) myersi Schm. and Bttg.

Nachrbl., 1891, p. 172, pl. 2, fig. 4.

Bagsa and Takao (Dr. Myers).

Clausilia (Hemiphædusa) bagsana Schm. and Bttg.

Nachrbl., 1891, p. 175, pl. 2, fig. 5.

Bagsa (Schmacker).

Clausilia (Hemiphædusa) sheridani Pfr.

P. Z. S., 1865, p. 830, Novit. Conch., p. 284, pl. 69, figs. 13-18.—Schm. and Bttg., Nachrbl., 1891, p. 173.

Formosa (Swinhoe); South Cape, Takao and Kankow (Schmacker); Arikwan, Sammaipo and Chikutozaki (Hirase).

Clausilia (Hemiphædusa) similaris H. Ad.

P. Z. S., 1866, p. 446, pl. 38, fig. 10.—S. and B., Nachrbl., 1891, p. 170, with var. *ventriosa*.

Formosa (Swinhoe); Takao and South Cape (Schm.). Var. *ventriosa* S. and B. from Kankow.

Clausilia (Hemiphædusa) odontochila Schm. and Bttg.

Nachrbl., 1891, p. 171, pl. 2, fig. 3.

Lakuli, in southern Formosa, type loc.; Hotawa (Hirase).

Clausilia odontochila nigra Pils.

Black, with the lip-tooth obsolete; densely striate, like *C. swinhoei*; spire entire. Ensui-kō (Hirase).

Clausilia (Hemiphædusa) exilis H. Ad.

P. Z. S., 1866, p. 317, pl. 33, fig. 6.—Mldff., Jahrb., X, 1883, p. 257 (*forma minor*).

Tamsui (Swinhoe, Hungerford); Chosokei (Hirase).

Clausilia (Formosana) swinhoei Pfr.

P. Z. S., 1865, p. 830, pl. 46, fig. 11.—Mldff., Jahrb., X, 1883, p. 252.—Schm. and Bttg., Nachrbl., 1891, p. 170.

Formosa (Swinhoe); Tamsui (Hungerford). Hotawa, Taiwan, Kiirun and Suganiikei (Hirase.)

The shells from Hotawa, Taiwan, are obese, with the striæ irregularly crimped, the intervals finely wrinkled across as in *C. formosensis*, but the color is dark purplish-brown as in *swinhoei*. Those from Kiirun and Suganiikei taper more and have finer nearly straight striæ without interstitial sculpture, and are clearly the true *C. swinhoei*.

There is a variety *subformosensis* Nevill mentioned by Schmacker and Boettger, but I have been unable to trace the name to a description.

Clausilia (Formosana) formosensis H. Ad.

P. Z. S., 1866, p. 317, pl. 33, fig. 7. — Mlldff., Jahrb., X, 1883, p. 253. —
S. and B., Nachrbl., 1891, p. 169 (new diagnosis).

Takao (Swinhoe, v. Fries); Bankimtsong (Schmacker); Arikwan,
Hotawa and Sammaipo (Hirase).

Clausilia (Heterozaptyx)¹ uraniscoptyx Schm. and Bttg.

C. (Hemiphædusa) uraniscoptyx S. and B., Nachrbl., 1891, p. 177, pl. 2,
fig. 6.

Bankimtsong (Schmacker).

Clausilia (Heterozaptyx) diaocptyx Pils.

Sammaipo (Hirase).

Clausilia (Thaumatoptyx) bivinota Pils.

Hotawa (Hirase).

ZONITIDÆ.**Ariophanta taiwanica** Mlldff.

Jahrb. d. malak. Ges., XII, 1885, p. 387, pl. 10, fig. 16.

Takao (Fries). A sinistral acutely carinate form of large size, diam.
28, alt. 15.5 mm.

Trochomorpha shermani (Pfr.).

Helix shermani Pfr., P. Z. S., 1865, p. 828, pl. 46, fig. 5.

Formosa (Swinhoe). A rather solid, opaque, uniform dark brown
shell with very minutely decussate surface. The exact locality in For-
mosa of several specimens in collection A. N. S. Phila. is not recorded.

Trochomorpha haenseli Schm. and Bttg.

Nachrbl., d. m. Ges., 1891, p. 152, pl. 1, fig. 5.

South Cape, Bankimtsong and Bagsa (Schmacker).

Trochomorpha pellucida n. sp.

Shell umbilicate, the diameter of umbilicus contained about four
and one-half times in that of the shell, conic-depressed, acutely cari-
nate, thin, pale brownish-corneous, quite translucent. Surface glossy,
finely striatulate with some very indistinct traces of spiral lines. Spire
low-conic with straight sides. Whorls $6\frac{1}{4}$, the earlier ones convex and
slowly increasing, the last two more rapidly widening, convex below the
suture, then concave. Last whorl concave above and below the acute
peripheral keel, convex beneath, rather suddenly passing into the
umbilicus, but not angular around it. The aperture is somewhat
oblique, with thin, acute peristome; the basal margin is rather deeply
arched, columellar margin steep and arcuate, upper margin short and
nearly straight.

¹*Heterozaptyx* Pils., sect. nov., type *Clausilia munus* Pils.

Alt. 5.3, diam. 10.8, width of the aperture 4.7, oblique alt. 3.4 mm.

Hotawa, Taiwan. Types No. 89,879 A. N. S. Phila., from No. 1,405 of Mr. Hirase's collection.

Only two specimens of this delicate little *Trochomorpha* were taken. It is closely related to *T. haenseli* S. and B., but is less depressed, the umbilicus smaller, the aperture larger, with basal lip much more deeply arcuate. The width of the aperture is contained in that of the shell 2.3 times in *T. pellucida*, about 2.7 times in *T. haenseli*.

***Trochomorpha cultrata formosana* n. subsp.**

Similar to *T. cultrata* in general shape and color, but *very distinctly, finely and evenly granulose* above and below. Whorls $6\frac{1}{2}$, the first two convex, the rest almost flat above; base excavated below the very acute keel, then quite convex, with a strong angle, almost a keel, around the umbilicus, which is a trifle wider than in *T. cultrata*. Basal lip strongly sinuous, being well *retracted midway between the peripheral and basal keels*.

Alt. 7, diam. 19.3 mm.; diam. umbilicus, measured from the keel, 8 mm.

Hotawa, Taiwan. Types No. 89,939 A. N. S. Phila., from No. 1,399 of Mr. Hirase's collection.

Twenty specimens of this fine *Trochomorpha* were taken. While evidently related to *T. cultrata* of the Ryukyu Islands, it may eventually be given specific rank.

***Otesia japonica* (Mlldff.).**

Nanina japonica Mlldff., Journ. Asiat. Soc. Beng., LIV, pt. 2, p. 59, 1885.

This species, originally described from Sengoku in Kyushu, and unknown in the Ryukyu chain, was taken by Mr. Okura at Kiirun (Keelung), five specimens.

***Helicarion hiraseanus* Pilsbry, n. sp.**

Shell imperforate, depressed-globose, thin and fragile, pale amber-colored, transparent. Surface very glossy, smooth and polished. Spire convex, narrow. Whorls $3\frac{1}{2}$, rapidly increasing, the last rounded peripherally and beneath. Aperture oblique, broadly lunate, the peristome with a narrow reflexed cuticular edge. Columella simple, thin, concave.

Alt. 6, diam. 9.5 mm.

Sammaipo, Taiwan. Types No. 90,235 A. N. S. Phila., from No. 1,431 of Mr. Hirase's collection.

Six specimens of this charming species were taken. No snail of similar *Vitrina*-like shape is known from Formosa, the Ryukyu Islands or Japan.

Macrochlamys vesta (Pfr.).

P. Z. S., 1865, p. 828, pl. 46, fig. 9.

Formosa (Swinhoe).

Macrochlamys fulgens Gude.

Proc. Malac. Soc. Lond., IV, p. 75, pl. 8, figs. 24-26.

Hotawa and Kiirun (Hirase). Originally described from Ryukyu.

Macrochlamys formosana Schm. and Bttg.

Nachrbl., 1891, p. 149, pl. 1, fig. 2, with var. *atypa*, p. 150.

South Cape (Schmacker); Tapanii (Hirase).

M. f. atypa S. and B.

Bankimtsong (Schmacker).

Macrochlamys par Schm. and Bttg.

Nachrbl. d. m. Ges., 1891, p. 150, pl. 3, fig. 3.

Takao (Schmacker).

Macrochlamys nitidus n. sp.

Shell minutely perforate, depressed, pale yellow, subtransparent, glossy and smooth, under a strong lens showing excessively fine spiral striæ below the suture and around the umbilicus; the parietal callus very thin, minutely granulose. Spire very low-conic. Whorls $4\frac{3}{4}$, slightly convex, the last nearly twice the width of the preceding, rounded at the periphery. Aperture deeply lunate, slightly oblique, the peristome simple, minutely dilated at the axis.

Alt. 3.5, diam. 5.8 mm.

Hotawa, Taiwan. Types No. 90,236 A. N. S. Phila., from No. 1,422 of Mr. Hirase's collection.

This species has much the general appearance of *Zonitoides nitida*, but with a less impressed suture and rather narrowly lunate aperture. A few somewhat smaller, thinner specimens, apparently not fully mature, were taken at Giiran.

Microcystina spadix Schm. and Bttg.

Lamprocystis spadix S. and B., Nachrbl., 1891, p. 151, pl. 1, fig. 4.

Takao. Very distinct by its brown color. The nodule on the columella shows it to be a *Microcystina*.

M. s. cinctus Pils.

Lamprocystis spadix S. and B., var. *cinctus* Pils., Proc. A. N. S. Phila., 1901, p. 194.

Formosa (Steere), exact locality unrecorded.

Microcystina lamprobasis n. sp.

Shell minutely perforate, low-conic above, convex below the rounded

periphery; thin, amber-tinted, somewhat transparent and brilliantly glossy below, opaque above, with the luster of a dull silk, the opaque appearance resulting from a sculpture of excessively fine and close vertical or radial striae which extends over the periphery and forms a band at the circumference of the base around the glossy basal area, which under a strong lens shows fine, well-spaced spiral lines. Whorls 4, convex, the suture well impressed. Aperture lunate, the columellar margin not perceptibly thickened, triangularly reflexed at the insertion.

Alt. 1.9, diam. 2.7 mm.

Giiran, Taiwan. Types No. 89,869 A. N. S. Phila., from No. 1,368 of Mr. Hirase's collection.

The dull silky surface is like that of some species of *Euconulus*, *Guppya*, etc. Only four specimens were taken. The non-callous columella may cause the removal of this species from *Microcystina*, yet the number of whorls is so small that we would hardly consider it a *Kaliella*. There are traces of spiral sculpture on the first whorl.

***Microcystina lissobasis* n. sp.**

Shell minutely perforate, depressed, with low-conoid spire and convex base; thin and fragile, pale yellow, subtransparent. Upper surface and a zone at and below the periphery having a silky luster, the rest of the base smooth and glossy. Whorls 4, convex, separated by an impressed suture, the periphery rounded. Aperture widely lunate, columella oblique, slightly thickened within, its edge a little dilated.

Alt. 1, diam. 2.1 mm.

Hotawa, Taiwan. Types No. 89,870 A. N. S. Phila., from No. 1,423 of Mr. Hirase's collection.

This species is related to *M. lamprobasis*, having the same silky upper surface and glossy base. It differs by its smaller size and much wider aperture. About 20 specimens were taken.

***Microcystina radiata* n. sp.**

Shell minutely perforate, depressed, thin, yellowish-corneous, subtransparent, very glossy. Sculpture of fine, close and minute radial striae and grooves above, the base smooth. Spire low-conoid, the apex obtuse. Whorls $4\frac{1}{2}$, moderately convex, slowly increasing, the last much wider, rounded peripherally, convex below. Aperture lunate; columella dilated above, slightly thickened within.

Alt. 1.7, diam. 2.5 mm.

Giiran, Taiwan. Types No. 90,224 A. N. S. Phila., from No. 1,371 of Mr. Hirase's collection.

Related to *M. sinapidium*, but unlike it in sculpture. Only four specimens taken.

Microcystina sinapidium (Reinh.).

Hotawa (Hirase). A common Japanese snail.

Kaliella depressa Mlldff.

Mlldff., Jahrb. d. m. Ges., 1883, p. 368, pl. 12, fig. 7; 1887, p. 42 (Canton and Hongkong).—Schm. and Bttg., Nachrbl. d. m. Ges., 1891, p. 154.

Tamsui (Boening).

Kaliella yaeyamensis Pils.

Nautilus, XV, p. 21, June, 1901.

Shohokumon and Daitomon, Taiwan (Hirase). This strongly striate *Kaliella* was taken in some abundance; about 30 were found at Daitomon. It was described from the Ryukyu Islands.

Kaliella costata n. sp.

Shell minutely perforate, acutely carinate, the spire conic, base convex; thin, amber-colored, translucent: *upper surface sculptured with strong ribs*, nearly straight and slightly oblique, the glossy smooth intervals three or four times the width of the ribs; first two whorls smooth; *base convex, smooth* and glossy. Spire straightly conic; whorls $5\frac{1}{4}$, convex. Aperture truncate-lunate. Columella vertical, thickened, with reflexed margin.

Alt. 3, diam. 3.5 mm.

Hotawa, Taiwan. Types No. 89,977 A. N. S. Phila., from No. 1,410 of Mr. Hirase's collection.

This is the most strongly sculptured *Kaliella* known to us. It is related to *K. costulata* Godwin-Austen, from the North Cachar Hills, 8,000 feet elevation (*Land and Fresh-water Mollusca of India*, p. 7, pl. 2, fig. 5), but in *K. costata* the base is smooth, the whorls much more convex; and while slightly larger than its Indian relative (which measures alt. 2.8, diam. 3.3 mm.), the Formosan shell has fewer whorls, $5\frac{1}{4}$ instead of 6.

Kaliella crenulata hotawana n. subsp.

Shell larger and more elevated than *K. crenulata*, with less distinct sculpture, the vertical striation being weak; whorls $6\frac{1}{4}$.

Alt. 3.4, diam. 3 mm.

Hotawa, Taiwan. Types No. 89,883 A. N. S. Phila., from No. 1,419 of Mr. Hirase's collection.

Kaliella venusta n. sp.

Shell very minutely perforate, conic with semiglobose base, thin, reddish-brown. *The surface has the luster of silk*, produced by excessively fine, close vertical striæ, which covers the upper surface and extend over the periphery nearly half way to the center of the base, *the*

middle region of the base being smooth and glossy. Spire straightly conic, the apex obtuse. Whorls $5\frac{1}{2}$, very convex, parted by a deep suture. Last whorl almost rounded at the periphery, there being the slightest indication of an obtuse angle; convex beneath, narrowly and rather deeply impressed around the perforation. Aperture semilunar, the columellar margin subvertical, suddenly dilated above.

Alt. 2.9, diam. 3.1 mm.

Hotawa, Taiwan. Types No. 89,882 A. N. S. Phila., from No. 1,418 of Mr. Hirase's collection.

The convex whorls, rounded periphery and silken surface with a smooth basal area, are the more prominent features of this little snail.

Kaliella longa n. sp.

The shell is imperforate, cupola-shaped, *much elevated*, the diameter only two-thirds the height, amber-colored, subtransparent and very thin. Surface glossy. The *very high spire has convex outlines and a very obtuse apex.* Whorls $7\frac{1}{2}$, the earlier ones quite convex, the later whorls less so; last whorl with a delicate, acute, thread-like peripheral keel, the base convex, impressed around the axis. Aperture semi-circular, small, the columellar margin reflexed above.

Alt. 3, diam. 2 mm.

Hotawa, Taiwan. Types No. 89,876 A. N. S. Phila., from No. 1,415 of Mr. Hirase's collection.

Compared with *K. praealta* and its varieties *izushichitoensis* and *xenica*, this species has more convex sides and a more obtuse apex. It is nearer in shape to *K. elongata* Godwin-Austen (*Land and Fresh-water Mollusca of India*, p. 9, pl. 2, fig. 9), but that has more whorls, a more acute apex and is larger, being 5 mm. high, 3.3 wide.

Sitala trochulus formosana Schm. and Bttg.

Nachrbl. d. m. Ges., 1891, p. 153.

Tamsui (Boening). *S. trochulus* Mildff. is a Chinese species, of which Schmacker and Boettger consider the Formosan snail a variety.

Sitala hirasei Pilsbry, n. sp.

Shell imperforate, acutely carinate, conic above, convex below the carina, excessively thin, fragile, amber-colored, somewhat transparent. Surface somewhat shining, roughened with rather coarse but low oblique ripples or wrinkles in places, and showing extremely fine spiral striae; on the apical two whorls these striae are delicate raised threads; on the later whorls and base they appear as lines of minute, close, regular punctures. Immediately around the axis the puncture lines give way to fine smooth spiral striae. Spire straightly conic; whorls $4\frac{1}{2}$,

slightly convex, rapidly increasing. Aperture rather large, the thin lip acutely angular in the outer part, basal and columellar margins arcuate, the latter delicately reflexed above.

Alt. 3, diam. 4 mm.

Sammaipo, Taiwan. Types No. 89,881 A. N. S. Phila., from No. 1,417a of Mr. Hirase's collection.

This remarkable *Sitala* is similar in shape to *S. insignis* of Japan, but is very much larger. We know of no Chinese or Indian species of like appearance.

***Sitala angulifera* n. sp.**

Shell imperforate, fragile, pale olive-green, subtransparent, acutely carinate in the middle, conic above, convex below the keel. Sculpture of rather coarse oblique wrinkles on the upper surface, the first whorl with numerous low or inconspicuous spiral threads; the other whorls showing some very weak cuticular spirals in a favorable light; base with more widely spaced radial wrinkles, and a few spiral lines below the keel. Spire straightly conic. Whorls $3\frac{1}{2}$, the first one convex, with subobsolete spiral lines, the last whorl nearly flat above the periphery. Aperture large, oblique, the thin peristome angular at the keel, arcuate below; columellar margin narrowly reflexed above.

Alt. 2, diam. 2.8 mm.

Alt. 2.3, diam. 2.7 mm.

Hotawa, Taiwan. Types No. 90,237 A. N. S. Phila., from No. 1,417 of Mr. Hirase's collection.

The shell is similar to *S. hirasei* in shape, but decidedly smaller with only $3\frac{1}{2}$ whorls. The rounded apical whorl is nearly smooth, usually without distinct spiral threads, and spirals are almost obsolete on the last whorl. The base is free from spiral striæ except for a few fine ones just below the periphery.

***Sitala circumcincta taiwanica* n. subsp.**

Shell larger than *S. c. elata* Gude, with stronger spiral threads and more whorls, fully 6. There are 6 or 7 spirals on each whorl. The base is smooth.

Alt. 2.2, diam. 1.7 mm.

Hotawa, Taiwan. Types No. 89,903 A. N. S. Phila., from No. 1,411 of Mr. Hirase's collection.

This is the largest of the *circumcincta* series. The Indian *Sitala conulus* Blauf. is wider than the Japanese and Formosan forms, with more minute spirals. It is a trifle wider than high, alt 2.9, diam. 3.1 mm.; and while allied, it is doubtless distinct.

ENDODONTIDÆ.***Punctum taiwanicum* n. sp.**

Shell umbilicate, very minute, with low-conoid spire and tubular whorls; brownish-corneous, very finely, densely striate. Whorls 4, convex. Aperture rounded lunate, the peristome simple and thin, its insertions widely separated.

Alt. 0.8, diam. 1.35 mm.; width of umbilicus 0.4, of aperture 0.56 mm.

Hotawa, Taiwan. Types No. 90,220 A. N. S. Phila., from No. 1,414 of Mr. Hirase's collection.

Very closely related to *P. atomus*, but slightly larger with less sharp striation, four whorls, and an umbilicus nearly as wide as the aperture. *P. atomus* has $3\frac{1}{2}$ whorls (not 3 as stated in the original description), and the aperture is much larger than the umbilicus.

PHILOMYCIDÆ.***Philomycus formosensis* (Ckll.).**

Limacella formosensis Ckll., Ann. and Mag. Nat. Hist. (6), VI, p. 384, 1893.
? *Philomycus bilineatus* Heynemann, Jahrb. d. m. Ges., 1885, p. 300.

Cf. Collinge, Journ. of Malac., VII, p. 82.

Formosa. This slug is not known to me by specimens. It requires comparison with the species of China, the Ryukyu Islands and Japan.

AURICULIDÆ.***Carychium pessimum* Pils.**

Proc. A. N. S. Phila., 1901, p. 562.

Hotawa (Hirase). Originally described from Tanega-shima in the N.E. Ryukyu group.

FRESH-WATER MOLLUSKS.**LYMNÆIDÆ.*****Lymnæa swinhoei* H. Ad.**

P. Z. S., 1866, p. 319, pl. 33, fig. 13.

Takao (Swinhoe). An allied form with shorter last whorl was taken at Toshen (Hirase, 1901).

***Planorbis compressus japonicus* Marts. (?).**

Toshen (Hirase, 1901). A form not quite so compressed and a little less angular than that named by von Martens, yet nearer to that than to any other named form known to us.

***Segmentina swinhoei* H. Ad.**

L. c., pl. 33, fig. 14.

Tungkang, 15 miles below Takao, and also at Takao in ponds and rice-fields (Swinhoe).

MELANIIDÆ.**Melania scabra** (Müll.).

Schm. and Bttg., Nachrbl. d. m. Ges., 1891, p. 181.

South Cape (Schmacker).

M. s. lyriformis (Lea).

Bankimtsong (Schmacker).

M. s. pagoda (Lea).

Takao (Schmacker).

Melania turriculus Lea.

P. Z. S., 1850, p. 190.—Brot, Conchyl. Cab. Melaniaceen, 1874, p. 239, pl. 25, figs. 7, 7a.—Schm. and Bttg., Nachrbl., 1891, p. 183.

South Cape (Schmacker).

Melania tuberculata chinensis Nevill.

Nevill, Handlist Ind. Mus., II, p. 244 (China).—Schm. and Bttg., Nachrbl., 1891, p. 183.—Bttg., Jahrb. d. malak. Ges., 1886, p. 11; 1887, p. 114.

Lakuli, southern Formosa (Fries).

Mr. E. A. Smith reports *M. tuberculata* Müll., collected by Dickson, P. Z. S., 1878, p. 729, pl. 46, fig. 9.

Melania juncea Lea.

Schm. and Bttg., Nachrbl., 1891, p. 184.

South Cape (Schmacker). Otherwise known only from Luzon.

Melania tenuisulcata Dkr.

P. Z. S., 1865, p. 197, No. 79.

Formosa (Swinhoe). Identified by H. Cuming.

Melania fulgurans Hinds is reported from Takao by Brot, *Melaniidæ*, p. 183, as recorded by H. Adams. Brot evidently doubts the occurrence of this New Ireland species over so wide an area. In a list of Formosan mollusks collected by Swinhoe and identified by H. Adams (P. Z. S., 1866, p. 146) the following Melanians are recorded: *M. pyramis* v. d. Busch, *M. lateritia* Lea, *M. fasciolata* Oliv., *M. crenulata* Chem. It is clear that the *Melaniidæ* of Formosa stand in need of a revision.

Melania formosensis E. A. Smith.

P. Z. S., 1878, p. 728, pl. 46, figs. 4, 5.—S. and B., Nachrbl., 1891, p. 183.—Bttg., Jahrb., 1886, p. 12; 1887, p. 115.

M. pyramis v. d. Busch, H. Adams, P. Z. S., 1866, p. 146.

Formosa (Dickson); Takao (Schmacker).

Melania dicksoni Smith.

P. Z. S., 1878, p. 728, pl. 46, fig. 6.

Formosa (Dickson).

Melania obliquegranosa Smith.

P. Z. S., 1878, p. 729, pl. 46, figs. 7, 8; with var. *monstrosa*.—Schm. and Bttg., Nachrbl., 1891, p. 185.—Bttg., Jahrb., 1886, p. 16; 1887, p. 116.

Formosa (Dickson); Takao and Bankimtsong (Schmacker); Kiirun (Hirase).

"*M. obliqueexpansa* Sow." of Brot, Nachrbl. d. m. Ges., 1883, p. 80, is evidently an error for *obliquegranosa*.

This species is viviparous.

Melania subplicatula Smith.

P. Z. S., 1878, p. 729, pl. 46, fig. 10.—Brot, Nachrbl. d. m. Ges., 1883, p. 84.

Formosa (Dickson).

Melania niponica E. A. Smith.

Brot, Nachrbl. d. m. Ges., 1883, p. 85.

Formosa (Mildff.). The specimens, identified by Brot, are said to belong to the var. *minor* Smith.

Melania libertina Gld.

Nevill, Handlist Ind. Mus., p. 266.

Tamsui (Hungerford). Identified by G. Nevill.

M. l. subplicosa Nevill.

Nevill, *l. c.*, p. 267.

Formosa (Hungerford); Kiirun (Hirase, 1901).

M. l. sublævigata Nevill.

Nevill, *l. c.*, page 266 (no description).

Tamsui (Hungerford).

M. l. plicosa Marts.

Nevill, *l. c.*, p. 267.

Mai Tionlek (Hungerford). Identified by G. Nevill.

M. l. microstoma Nevill.

Nevill, *l. c.*, p. 267 (no description).—Bttg., Jahrb., 1886, p. 5 (description).

Formosa (Hungerford).

VIVIPARIDÆ.**Viviparus chinensis** (Gray).

Paludina chinensis Gray has been reported from Formosa collected by Swinhoe, the specimens identified by Cuming, *P. Z. S.*, 1865, p. 196. Whether they are different from the following species remains to be seen.

Viviparus malleatus (Reeve).

Specimens which seem referable to this Japanese species were taken at Kaisanko (Hirase, 1901).

Viviparus angularis (Müll.).

P. Z. S., 1866, p. 146.

Formosa (Swinhoe). Identified by H. Adams.

AMNICOLIDÆ.**Stenothyra glabra** A. Ad.

G. Nevill, Handlist Moll. Indian Mus., p. 43.

Tokohan (Hungerford). Described from Peiho, China.

Stenothyra formosana Pils.

Nautilus, XVIII, p. 8, May, 1904.

Kironten (Hirase).

CYRENIDÆ.**Corbicula fluminea** (Müll.).

Prime, Annals N. Y. Lyc. N. H., VIII, p. 60, fig. 4.

Taihoku and Kaisanko (Hirase, 1901).

Corbicula subsulcata Dkr.

Clessin, Conchyl. Cab. Cycladeen, p. 164, pl. 29, figs. 5, 6 (1879).

Formosa (Clessin). Clessin gives no reference to a description of this species by Dunker.

Corbicula insularis Prime.

Ann. Lyc. N. H. of N. Y., VIII, 1864, p. 414, fig. 67.

Formosa (Prime).

Cyrena (Cyrenodonax) formosana Dall.

Proc. Biol. Soc., Washington, XVI, p. 6, 1903.

Formosa.

UNIONIDÆ.**Anodonta swinhoei** H. Adams.*Anodonta swinhoei* H. Ad., P. Z. S., 1866, p. 446.*Anodon swinhoei* H. Ad., Sowerby, Conch. Icon., XVII, pl. 27, fig. 108. Copied by Clessin, Conchyl. Cab. Anodonta, p. 225, pl. 75, fig. 6, and erroneously credited to Reeve.*Cristaria swinhoei* H. Adams, Simpson, Synopsis of the Naiades, p. 586 (in part).

Formosa (Swinhoe). The localities "Tonkin" and "Cambodia," given by Simpson, had their inception in errors. While the species may prove to be a *Cristaria*, no evidence making for that view has been published.

Henry Adams gives the size as, length 90, alt. 50, diam. 28 mm. The figure in *Conch. Icon.* measures, length 76.5, alt. 47.7 mm.

Unio swinhoei 'Reeve,' Sowb.

Unio swinhoei Rve. MS., Sowerby, Conch. Icon., XVI, pl. 42, fig. 232, May, 1866 (false locality "Camboja").

Unio swinhoei H. Ad., P. Z. S., 1866, p. 319.

Formosa (Swinhoe). This species was published independently by Sowerby and Henry Adams. The later author presented his paper to the Zoological Society at the meeting of May 22, 1866; and since a colored plate had to be prepared, it could not well have been published for some months later. The descriptions, so far as they go, agree. Sowerby's figure measures, length 65, alt. 40 mm.; and Adams gives the size as, length 60, alt. 39, diam. 22 mm. Sowerby gives the false locality "Camboja"—a region where Swinhoe never collected; but then the monograph of *Unio* in the *Iconica* is famous for false localities.

Mr. Simpson, in his *Synopsis of the Naiades*, 1900, p. 586, has quoted this species in the synonymy of "*Cristaria swinhoei* H. Ad.," which is a totally different species. It may belong to Simpson's genus *Lamellidens*.

Nodularia douglasiae taiwanica Pils., n. subsp.

Shell oblong, narrow, inflated, rather solid, the dorsal and ventral margins subparallel, the former slightly arcuate, anterior end rounded, basal margin straightened in the middle, posterior end long, somewhat pointed. Beaks full, swollen, worn but showing traces of oblique corrugation on the anterior and posterior slopes; situated at the anterior two-sevenths of the length. Exterior covered with a blackish cuticle, somewhat wrinkled along growth-lines. Interior white, iridescent posteriorly. Cardinal teeth compressed, strong, single in the right, double in the left valve. Laterals moderately strong, rather short.

Length 49, alt. 25, diam. 19.7 mm.

Formosa. Types No. 58,170, A. N. S. Phila., received from Andrew Garrett.

A mussel closely related to *N. douglasiae* of China, but showing only very weak traces of corrugation.

APPENDIX.

The following species, received since the preceding was in type, adds a genus new to the Formosan fauna.

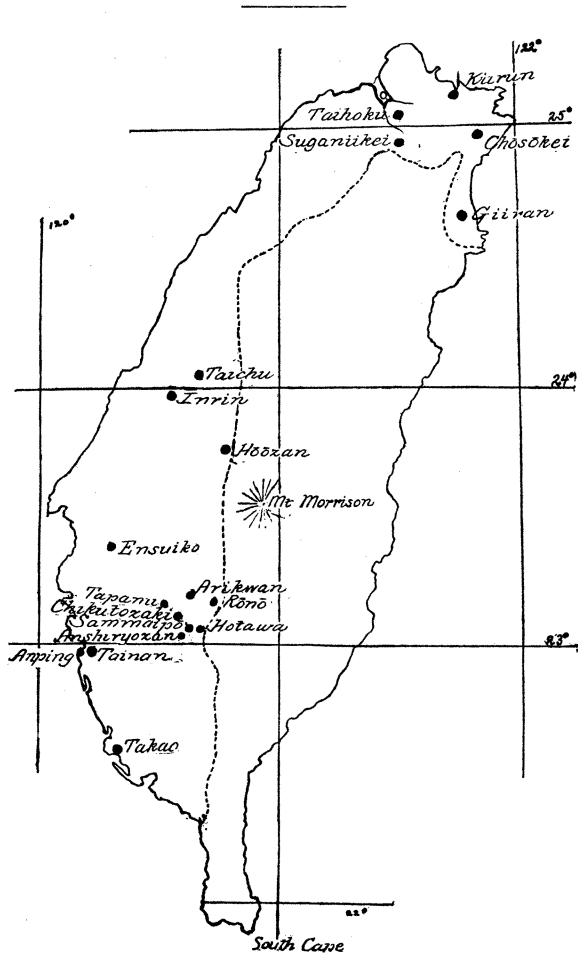
Blanfordia formosana n. sp.

The shell is perforate, light brown, rather solid, turrite-conic, the outlines of the spire straight, apex rather acute. Whorls $6\frac{3}{4}$, quit

convex and parted by well impressed sutures, smooth except for faint growth-lines. The last whorl has a rounded and rather strong crest or varix behind the outer lip. The aperture is ovate, brown within; peristome brown-edged, the columella concave and somewhat thickened, whitish. Length 7, diam. 3.25 mm., length of aperture with peristome 2.8 mm.

Rōnō. Types No. 90,726 A. N. S. P., from No. 1,453 of Mr. Hirase's collection.

This species is related to *B. japonica* (A. Ad.) of Sado Island, but is smaller and especially narrower, with a much lower varix behind the outer lip. The apex is perfect.



Some of the localities explored by Mr. Okura are not to be found on any Occidental map. The location of these places has been indicated on the outline map, p. 751. Mr. Schmacker says that Bagsa (or Baksa) where his Japanese collector worked, is half a degree W.N.W. from Tainan (Tainan-fu or Taiwan-fu), and Bankimtsong is directly east of Takao (Takow). The orthography of Formosan place-names is in a state of transition, owing to the change of ownership of the island and the diverse phonetics of Chinese and Japanese; the older mode being the Chinese, the newer Japanese. Thus, *Keelung* of ordinary maps is *Kiirun* in the Japanese mode.

The dotted line indicates the approximate border of the western mountainous area, most of which is still practically unknown except to adventurous camphor gatherers, and is inhabited by savage and in part head-hunting tribes.